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71 Applicant: **KITAMURA MACHINERY CO.,LTD.**  
**1870 Toide-Komyoji**  
**Takaoka-shi Toyama-ken(JP)**

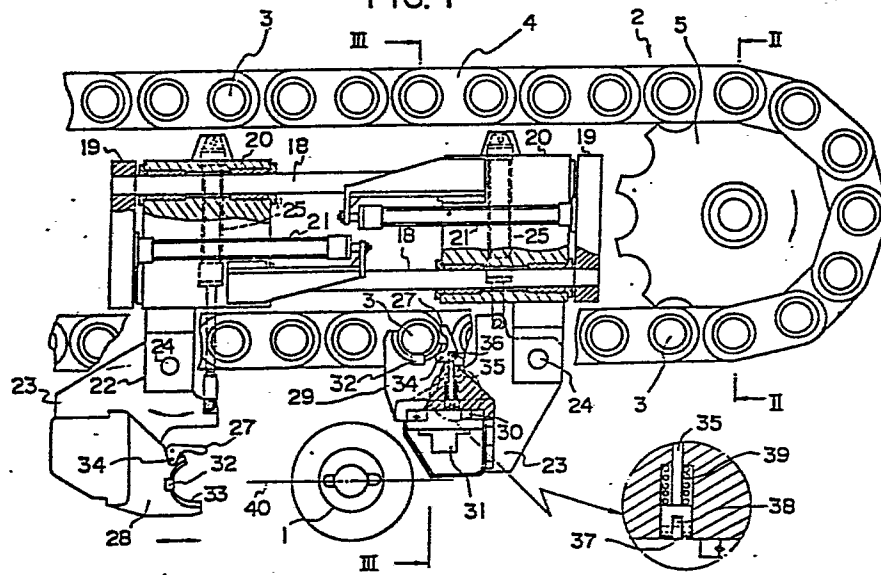
72 Inventor: **Kitamura, Koichiro**  
**3-11-5 Ekinan**  
**Takaoka-shi Toyama-ken(JP)**

74 Representative: **Patentanwälte Ruff und Beier**  
**Neckarstrasse 50**  
**D-7000 Stuttgart 1(DE)**

54 **Automatic tool changer.**

57 During the automatic changing of tools between a spindle (1) of a machine tool and a tool magazine (2), a changing operation of causing one of a pair of tool changing arms (28, 29) to stand by in the vicinity of the spindle (1) to remove the used tool and another changing operation of causing the other tool changing arm to grip the tool to be used for the next operation on the tool magazine (2) and stand by are performed alternately thereby reducing the tool changing time.

FIG. 1





DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	WERKSTATT UND BETRIEB, vol. 105, no. 3, March 1972, pages 213-217, München, DE; H. MÖNKEMÖLLER: "Werkzeugmaschinen für ein automatisches Fertigungssystem" * Page 215, right-hand column, lines 11-21; figures 4,5 *	1	B 23 Q 3/157
A	Idem	2	
X	FR-A-1 507 373 (ATELIERS G.S.P.) * Pages 2-4; figures 3,4 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A		2	
A	US-A-4 041 601 (SCHIMANSKI) * Figures 3,5 *	3	B 23 Q
A	GB-A-1 187 126 (KÖPINGS MEKANISKA VERKSTADS AB)		
A	PATENTS ABSTRACTS OF JAPAN, vol. 8, no. 158 (M-311) [1595], 21st July 1984; & JP - A - 59 53 138 (ENSHIYUU SEISAKU K.K.) 27-03-1984		
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-05-1986	Examiner ROSENBAUM H. F. J.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone  
Y : particularly relevant if combined with another document of the same category  
A : technological background  
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T : theory or principle underlying the invention  
E : earlier patent document, but published on, or after the filing date  
D : document cited in the application  
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